The Applicant directs the Examiner's attention to the fact that Torii expressly *teaches away* from any battery monitoring circuitry *not* having mutually insulated control power sources (which Torii says make gain trimming amplifiers unnecessary and therefore reduce costs). Torii teaches (at col. 2, line 65 to col. 3, line 17) the following:

> According to the present invention, in a battery voltage measurement device for measuring respective voltages of a large number of batteries that are connected in series, differential amplifiers are provided that obtain output voltages corresponding to two terminal voltages of each battery, said differential amplifiers being divided into groups of a suitable number, **each group being provided with a mutually insulated ground terminal and provided with a mutually insulated control power source, each control power source being connected between a power source input terminal of each differential amplifier and each ground terminal of the respective group. Thus, since the control power sources are connected between the power source input terminal and ground terminal in a mutually insulated condition in each group of the differential amplifiers, the voltage with respect to the respective ground terminal that is applied to the input terminal of each differential amplifier in each group becomes low. Consequently, the range of setting of the gains becomes wide, making it unnecessary to provide a gain trimmming (sic) amplifier; lower costs can thereby be achieved.**
>
> (emphasis added)

Teaching away is the antithesis of the art's suggesting that a person of ordinary skill go in the claimed direction; essentially, teaching away from the art is a per se demonstration of lack of prima facie obviousness. *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ2d 1529 (Fed. Cir. 1988); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Nielson*, 816 F.2d 1567, 2 USPQ2d 1525 (Fed. Cir. 1987).

There are even further disincentives to combining the teachings of Torii with those of Harvey. For example, while Harvey describes a measuring circuit powered from the device being measured, Harvey also adds an additional regulation step to condition the

power before using it to power the measurement circuitry. In contrast, in paragraph 9 of the present application, the Applicant describes how one of the motivations behind the present invention is the elimination of additional components such as external power supplies. While Harvey teaches of a perhaps non-isolated regulator, the drawbacks of the added component are similar to the drawbacks of having external power supplies. Therefore, **there would be no incentive for a person skilled in the art to modify Torii's monitoring circuitry by removing the external power supplies (contrary to Torii's teachings, no less) only to have to add additional components in the form of regulators as taught by Harvey.**

Powering the measuring circuitry directly from the cell being measured creates several issues that the present invention attempts to overcome (such as clipping measured values due to drooping supply voltages and potentially losing accuracy during voltage transients). These challenges are not met through the teachings of Torii or Harvey as they instead describe circuits and techniques that are well known in the prior art. Such circuits do not anticipate or suggest the subject matter claimed in this application. The Applicant has chosen in the present invention to accept and work around the shortfalls of directly powering the measurement circuitry for the advantage of a simplified and less expensive hardware circuit.

Courts have often recognized the principle that hindsight analysis is to be avoided when considering obviousness. In *Hughes Aircraft Co.* v. *United States*, 215 U.S.P.Q. 787 (Ct. Cl. Trial Div. 1982), the court stated:

> In any consideration of obviousness, it is always necessary to be vigilant against the possibility of hindsight creeping into the analysis. One way that the courts have guarded against hindsight is by insisting that the reason for making the suggested changes be apparent at the time the invention was made to a person of ordinary skill in the art. Here, there is simply no suggestion in the art to make these changes and thus they would not have been obvious.

The Applicant respectfully submits that there is simply no suggestion in Torii's teachings or in Harvey's teachings or otherwise in the prior art to modify Torii's circuitry to arrive at the apparatus and method claimed in this application; in complete contrast, there are several disincentives, as noted above. It is therefore submitted that no assertion of *prima facie* obviousness can properly be made. For these reasons, independent claims 1 and 18

are patentable over Torii and Harvey, whether taken individually or in combination. Claims 2-17 and 19-33, each being directly or indirectly dependent on patentable independent claim 1 or 18 and including all of its limitations, would therefore also be patentable over Torii and Harvey, rendering the Examiner's additional comments and citations regarding each of those claims moot.

In any event, with respect to the Examiner's specific comment that the limitation of claim 2 would be inherent in the battery taught by Harvey, the Applicant respectfully submits that, when powering a device from a stable power supply such as that used by both Torii and Harvey, the Examiner's comment may be true; however, when applied to the invention as defined by independent claim 1 of this application where the supply is variable and dependent on the condition of the cells within a group, the selection of cell groups such that the resulting voltage is valid over the range of operating condition becomes less trivial. In the present invention, the minimum expected cell voltage could theoretically be zero. For this reason the selection of a minimum voltage defines the minimum voltage under which the device will no longer output a valid reading and the maximum voltage that can be measured. The selection of the appropriate number of cells within a group reduces the chances of falling below the limits of the device. Selection of amplifier gains (as described in claim 4) and invalid output feedback (as in claim 31) are significant aspects of ensuring the circuit can measure the cell over the desired voltage range.

With respect to the Examiner's specific comments regarding claim 7, it appears that the Examiner may have misunderstood the meaning of the term "analog conditioner" in the context of the present invention and "analog signal conditioning" as taught by Kagan. "Signal conditioning" is well known in the art as the means of transforming a signal from a raw form to an alternate form compatible with the intended input circuit; conditioning in such a context typically includes scaling, filtering or level shifting, and "conditioning" in this sense is indeed taught by Kagan. However, as explained in detail in paragraph 39 of the present application, "analog conditioner" means an analog circuit which reduces physical number signals to be input into each isolator; such a circuit may include diodes which pass only the highest or lowest signals. Further, unlike Kagan's use of well known sample and hold multiplexing techniques which requires additional multiplexing hardware and timed sampling hardware to produce an array of readings with a single signal, and where the resulting signal must be parsed digitally to retrieve the individual measurements from the carrier signal, the signal reduction of the analog conditioner of the present invention results in a single continuous analog signal.

In light of the foregoing, it is submitted that all pending claims are in condition for allowance. Reconsideration of the rejections and objections is requested. The Applicant respectfully requests favorable action on this application at an early date.

Respectfully submitted,

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